

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Adams, et al.

Continuation of Application No. 09/304,327

Filed: April 13, 2001

For: IMPLANTABLE MIDDLE EAR
ASSIST SYSTEM USING
PIEZOELECTRICAL TRANSDUCER
FILM

To: BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

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By Jacquelyn K. Torborg
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PRELIMINARY AMENDMENT

The present amendment is being filed concurrently with the divisional application identified above. Please amend the application as follows:

In the Specification

On page 1, please insert -- This application is a divisional of co-pending, commonly assigned patent application entitled IMPLANTABLE MIDDLE EAR HEARING ASSIST SYSTEM USING PIEZOELECTRICAL TRANSDUCER FILM, serial number 09/304,327, filed on May 3, 1999, which is in turn a continuation application of serial number 08/908,243, filed on August 7, 1997, now United States Patent No. 5,899,847, issued May 4, 1999. --.

In the Claims

Please cancel claims 2-22.

Please add new claims 23-46 as follows:

23. The system of claim 1, in which the film has a substantially straight length.
24. The system of claim 1, in which the film comprises polyvinylidene fluoride.
25. The system of claim 1, in which the film is a bi-element transducer film.
26. An at least partially implantable hearing assistance system, comprising:
 - a vibrator including a mount, adapted to be secured to a middle ear and a piezoelectric transducer film, carried by the mount, the film being proportioned to be mechanically coupled to an auditory element of an inner ear and to vibrate the auditory element in response to an electrical input signal, the film being adapted to be secured at a plurality of constraint points;
 - an electronics unit, electrically coupled for providing the electrical input signal to the vibrator; and
 - a programmer, adapted for communicative coupling to the electronics unit.
27. The system of claim 26, in which the inner ear includes at least one of an oval window, a round window, a vestibule, and a semicircular canal.
28. The system of claim 26, in which the film has at least one of a hoop shape a substantially straight shape, and a bow shape.

29. The system of claim 26, in which the film comprises polyvinylidene fluoride.
30. The system of claim 26, in which the film is a bi-element transducer film.
31. An at least partially implantable hearing assistance system, comprising:
- a vibrator including a mount, adapted to be secured to a middle ear and a piezoelectric transducer film, carried by the mount, proportioned to be mechanically coupled to an auditory element of an inner ear and to vibrate the auditory element in response to an electrical input signal;
 - an electronics unit, electrically coupled for providing the electrical input signal to the vibrator; and
 - a programmer, adapted for communicative coupling to the electronics unit.
32. The method of claim 31, in which the auditory element of the inner ear further comprises at least one of an oval window, a round window, a vestibule, and a semicircular canal.
33. An at least partially implantable hearing assistance system, comprising:
- a vibrator including a mount and a piezoelectric transducer film, the mount being securable proximate a patient's middle ear and the piezoelectric transducer film being carried by the mount and conformed to be mechanically coupled to the middle ear such that an auditory element is vibrated in response to an electrical input signal;
 - an electronics unit in electrical communication with the vibrator and providing the electrical input signal to the vibrator; and
 - a programmer adapted for communicative coupling to the electronics unit.
34. The system of claim 33, in which the programmer is adapted for acoustic coupling.

35. The system of claim 33, in which the programmer is adapted for transdermal communication.
36. The system of claim 33, in which the inductive element is a coil.
37. The programmer of claim 33, further comprising means for adjusting hearing assistance parameters.
38. The programmer of claim 37, in which said hearing assistance parameters include parameters selected from the group consisting of on/off, standby mode, type of noise filtering, frequency response, volume, gain range, maximum power output, delivery of a test stimulus on command, and any combination thereof.
39. The programmer of claim 37, in which at least one of the hearing assistance parameters are programmable by a patient.
40. The programmer of claim 37, in which at least one of the hearing assistance parameters are programmable by a physician.
41. A method of programming a hearing assistance system at least partially implanted in a patient's middle ear, the method comprising the steps of:

activating a programmer adapted for communicative coupling to an electronics unit, the electronics unit being disposed proximate the patient's middle ear and in electrical contact with a vibrator, the vibrator including a mount and a piezoelectric transducer film, the mount secured proximate the patient's middle ear and the transducer film being carried by the mount and proportioned to be mechanically coupled to the

patient's middle ear; setting a value of a hearing assistance parameter in the programmer;
and

transdermally communicating the hearing assistance parameter value from the
programmer to the electronics unit.

42. The method of claim 42, in which the patient sets the hearing assistance parameter.
43. The method of claim 42, in which a health care provider sets the hearing assistance parameter.
44. The method of claim 42, in which at least a portion of the transdermal communication is by acoustic coupling.
45. The method of claim 42, in which the hearing assistance parameter value is selected from the group consisting of on/off, standby mode, type of noise filtering, frequency response, volume, gain range, maximum power output, delivery of a test stimulus on command, and any combination thereof.

REMARKS

The present amendment is being filed concurrently with the divisional application identified above. This application is a divisional of co-pending, commonly assigned patent application serial number 09/304,327, filed on May 3, 1999, which is in turn a continuation application of serial number 08/908,243, filed on August 7, 1997, now United States Patent No. 5,899,847, issued May 4, 1999, both of which are disclosed herein and incorporated by

reference. The specification has been amended to reference the application and patent respective.

Claims 2-22 have been cancelled, and claims 23-45 have been added.

Applicant respectfully requests that the present amendment be entered before the calculation of filing fees.

Respectfully submitted,

Dated: 4/13/01

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